Problem 3.4: Superposition Principle

One of the most important consequences of circuit laws is the **Superposition Principle**: The current or voltage defined for any element equals the sum of the currents or voltages produced in the element by the independent sources. This Principle has important consequences in simplifying the calculation of circuit variables in multiple source circuits.

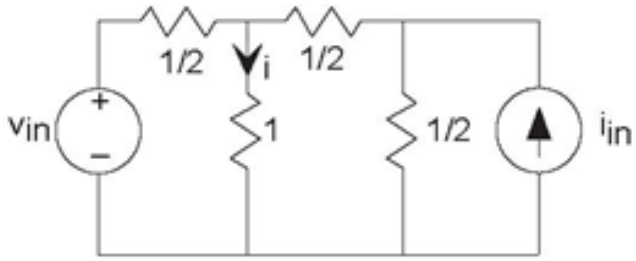

Figure 3.55 Superposition Principle

1. For the depicted circuit (Figure 3.55), find the indicated current using any technique you like (you should use the simplest).
2. You should have found that the current ***i*** is a linear combination of the two source values:$i = C1vin + C2iin$. This result means that we can think of the current as a superposition of two components, each of which is due to a source. We can find each component by setting the other sources to zero. Thus, to find the voltage source component, you can set the current source to zero (an open circuit) and use the usual tricks. To find the current source component, you would set the voltage source to zero (a short circuit) and find the resulting current. Calculate the total current ***i*** using the Superposition Principle. Is applying the Superposition Principle easier than the technique you used in part (1)?